



Metal Powder

MIM Sintering for development and toll production

centro tecnológico da cerâmica e do vidro | coimbra | portugal



CTCV has a background in powder technologies, namely high temperature sintering (pressed and injection moulded MIM/CIM powder materials)



ELNIK MIM3002 Furnace – CTCV - iParque

In order to be able to offer sintering services and other high-added value thermal treatments to customers and partners, CTCV has a new a **MIM Sintering with multiple atmospheres capability with 50 litres of capacity (retort).**

This equipment is a flexible technology solution for metal materials, specials alloys, advanced composites or other new under-development sintered materials.

The furnace has a 50 litres work zone, able to operate under **primary vacuum up to 0.01mbar, high vacuum 10E-6mbar and partial pressure atmosphere of H₂, N₂ or Ar**, or mixtures of them. With a maximum temperature of **1650°C under vacuum and 1500°C**

under hydrogen, it is possible to ramp at rate **0,1 to 10 K/min.**

Other key features are the **all refractory metal (moly)** hot-zone for a high purity atmosphere, a low temperature distribution of only **+/-3°C under gas and +/-5°C under vacuum** in order to assure a low product quality variability, **high efficient organic binder removal** when it is used in shaping process, and the possibility of working **in several atmospheres**, even in the same cycle run.

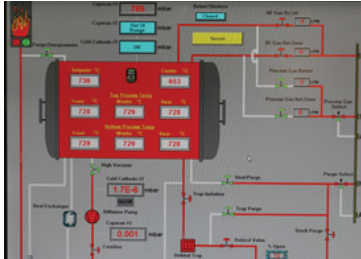
By this way, CTCV is able to process **a wide variety of materials, thus reaching a great part of the company needs.**

CTCV solar • nano

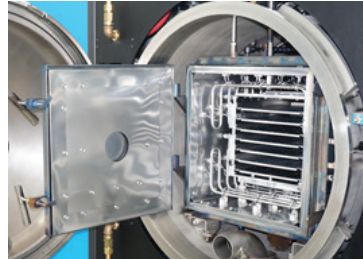
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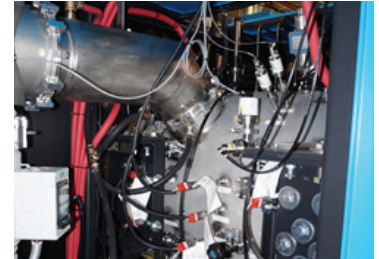
Centralized control interface (temperature, vacuum and process gases)



Access to the vacuum chamber and hot-zone



Hot-zone and retort. Use to shelves to support the parts produced by metal injection moulding (MIM)



Detail of the instrumentation and connections to the auxiliary equipment

Metal Injection Process (MIM)



The MIM process combines the flexibility of the plastic injection moulding with the structural characteristics of the metals and offers an economical solution for high complex geometries.

The process allows **the production of metal parts for a diverse applications sectors, such as engineering and industry (components and tools), medicine (instruments and implants), transports (automotive, aeronautics), consumer products (electrical and mechanical systems, watchery) or communication and electronics.**

Advantages:

- A well-established manufacturing technology and proof for the production of small metal (<250g steel), net-shape, tight tolerance and high performance parts,
- Economic alternative to the traditional metal shape technologies, such as machining, investment casting and powder metallurgy,
- Superior choice for applications demanding shape complexity and material key properties (high resistance, magnetic permeability or corrosion resistance) that cannot be satisfied by injection foundry alloys and plastics,
- Offers a high potential way for a unique step for the part consolidation, turning to a competitive alternative to machined parts,
- Many economical and design limitations of the traditional metalworking technologies can be promptly overcome by MIM.

CTCV offers **R&D services and toll production in Powder Injection Moulding (PIM) technology, which includes MIM (metal parts) and CIM (ceramic parts).**

Under contracting or under public granting, CTCV develops innovative and customized solutions to customers and partners.